REMARKS

In reply to the Non-Final Office Action of July 28, 2004, Applicant submits the following remarks.

Applicant thanks the examiner for the continuing allowance of claims 39 and 40, and the continuing indication that claim 9 is allowable.

Claims 1-21, 23, 28-29, 34-40, and 42 were examined. Dependent claim 43 has been added, but no claims have been amended or cancelled. Accordingly, claims 1-21, 23, 28-29, 34-40, and 42-43 are presented for consideration, of which claims 1, 14, 21, 38, 39, and 40 are independent.

Claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Egan in view of Ims (3,751,979). Applicant respectfully disagrees for at least the reasons that there is no motivation for the combination, and the combination does not disclose or suggest each of the recitations of independent claim 1.

Applicant thanks the examiner for removing Rozenblit. The Office Action now applies Egan, but continues to argue that Ims is an appropriate reference for a combination. For at least the following reasons, Applicant submits that the there is no motivation to modify Egan with Ims.

Ims describes a system having two separate input signals, operating at two separate frequencies (see, e.g., col. 1). Ims teaches that separate PLLs (FIG. 8) may be used for each of the two separate input signals, and that the outputs from these two PLLs may feed a switch that selects between the two outputs. Ims provides the two PLLs as an alternative to a single-PLL system (FIG. 5) in which the input to the PLL is switched between the two separate signals and frequencies.

This disclosure from Ims is not analogous to that in Egan, in which there is only a single input signal. As explained below, the difference in the number of input signals has a variety of important practical implications. Accordingly, one of ordinary skill in the art would not look to Ims to modify Egan. Moreover, there is no motivation to modify Egan with Ims. Ims mentions that one of the advantages of the FIG. 8 implementation, over the FIG. 5 implementation, is that in FIG. 8 the two PLLs stay in lock whereas in FIG. 5 the single PLL implementation has the

delay associated with repeatedly acquiring a new signal and frequency each time the input signal is switched. These conditions, and thus the motivation to use two PLLs, do not exist in Egan.

First, there is no indication that modifying Egan with Ims would provide the above advantage of having each PLL stay in lock and avoiding the need to reacquire the signals. Specifically, there is no indication that the wide bandwidth loop of Egan would stay in lock when the narrow bandwidth loop (assumed for the sake of argument to be in a separate PLL) loses lock. Egan indicates, rather, that a wide bandwidth loop will reacquire lock faster than a narrow bandwidth loop. Thus, even if Egan had two PLLs, there is no indication that both PLLs would stay in lock, particularly in a vortex flow meter application as recited in independent claims 14, 21, and 38.

Second, there is no indication that Egan has the disadvantage of being delayed each time a bandwidth change is made, as described with respect to FIG. 5 of Ims. With respect to changes from wide to narrow bandwidth, there is no need to reacquire lock because Egan presumably switches back to narrow bandwidth without losing lock. Even changes from narrow to wide bandwidth would not necessarily realize a benefit from having two separate PLLs. This follows because Egan processes the same input signal regardless of the bandwidth and, accordingly, a faster lock period may be expected as compared to Ims' FIG. 5 implementation in which separate signals with separate frequencies are processed by each PLL. There is no indication that this presumably fast lock period for Egan would be any longer than the delay associated with switching between outputs of separate PLLs. Thus, there is no motivation to modify Egan. As the examiner is no doubt aware, "'obvious to try' is not the standard under § 103." In Re O'Farrell, 853 F.2d 894, 903 (Fed.Cir. 1988).

In addition to the lack of motivation to combine, neither Egan nor Ims discloses or suggests at least "a first phase-locked loop . . . operable to lock into a frequency of an input signal" and "a second phase-locked loop . . . operable to lock into the frequency of the input signal" (claim 1, emphasis added). As explained above, Egan discloses only a single PLL having different bandwidth characteristics and not two separate PLLs both "operable to lock into the frequency of the input signal" as recited, and Ims discloses only that two PLLs can operate on different signals and not that both PLLs are "operable to lock into the frequency of the input signal" as recited.

Further, neither Egan nor Ims discloses or suggests at least a "switch operable to switch . . . between the first output signal and the second output signal in response to a change in the frequency [of the input signal], and based on at least one of a first lock indicator signal and a second lock indicator signal" (claim 1). As explained above, Egan does not even have two output signals as recited and, therefore, cannot have a switch switching between such output signals. Further, Egan does not have a switch that switches between any output signals, but only a switch that changes bandwidth characteristics. Likewise, as explained above Ims does not even have two output signals as recited. Further, as explained below, Ims does not switch "in response to a change in the frequency [of the input signal], and based on at least one of a first lock indicator signal and a second lock indicator signal" as recited.

Ims has a switch 208, but switch 208 does not switch "in response to a change in frequency" (claim 1), but in response to a control signal; no change in frequency is required. Switch 208 also does not switch "based on . . . a . . . lock indicator signal" (claim 1), but based on the control signal. Indeed, Ims describes switching to a PLL that is out of lock (Fig. 5; col. 16, lines 45-55), as well as switching to a PLL that is in lock (Fig. 8; col. 16, lines 45-55), revealing that the decision to switch in Ims is not related to whether the PLLs are locked.

Accordingly, for at least these reasons Applicant submits that a prima facie case of obviousness has not been established with respect to claim 1 and claims that depend therefrom and, in the alternative, that such claims are patentable over the applied references.

Claims 14-19 and 37, each of which depends from claim 14, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Egan, Ims, and Thompson (4,463,612) and further in view of Vignos (5,576,497). Applicant respectfully disagrees for at least the reasons that, as explained in the above discussion of claim 1, (i) there is no motivation for the combination of Egan and Ims, particularly in light of the fact that claim 14 is directed to a "vortex flowmeter" and recites "vortex shedding," (ii) the combination does not disclose or suggest at least claim 14's recitation of multiple "phase-locked loops (PLLs) having different characteristics from each other and operable to receive the flow sensor signal and lock onto the flow sensor signal," and (iii) the combination does not disclose or suggest at least claim 14's recitation of "a switch for switching . . . among the PLL output signals in response to a change in the frequency, and based on one or more lock indicator signals."

Thompson describes a single-PLL vortex flow meter, and Vignos describes an adaptive filter, and neither Thompson nor Vignos, alone or in combination, cures the deficiencies of Egan and Ims.

Accordingly, for at least these reasons Applicant submits that a prima facie case of obviousness has not been established with respect to claim 14 and claims that depend therefrom and, in the alternative, that such claims are patentable over the applied references.

Claims 3-5, 8, 13, 21, 34, 35, and 42, each of which depends ultimately from either claim 1 or claim 21, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Egan in view of Ims and further in view of Thompson. Applicant respectfully disagrees for at least the reason that, as explained in the above discussion of claim 1, there is no motivation for the combination of Egan and Ims, particularly in light of the fact that claim 21 is directed to a "vortex flowmeter." Further, for the reasons given above in the discussion of claim 1, neither Egan nor Ims discloses or suggests at least (i) "switching . . . from an output signal of the first PLL to an output signal of the second PLL when the lock indicator signal indicates that the second PLL is locked," (ii) "switching . . . from the output signal of the second PLL to the output signal of the first PLL when the lock indicator signal indicates that the second PLL is out of lock," and (iii) "locking into a frequency of the input signal using the first PLL" and "locking into the frequency of the input signal . . . using the second PLL."

Applicant also notes that the Office Action does not address the specific limitations of "switching . . . from an output signal of the first PLL to an output signal of the second PLL when the lock indicator signal indicates that the second PLL is locked," and "switching . . . from the output signal of the second PLL to the output signal of the first PLL when the lock indicator signal indicates that the second PLL is out of lock" (claim 21). One or more similar limitations is also found in claims 34 and 35.

Thompson does not cure the deficiencies of Egan and Ims.

Accordingly, for at least these reasons Applicant submits that a prima facie case of obviousness has not been established with respect to claim 21 and claims that depend therefrom and, in the alternative, that such claims are patentable over the applied references.

Claims 38 and 20 (which depends from claim 1) both stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Egan, Ims, Thompson, and Vignos and further in view of Ito

(4,201,084). Applicant respectfully disagrees. With respect to claim 20, Applicant submits that the rejection is overcome for at least the reasons discussed above with respect to claim 1. With respect to claim 38, Applicant submits that the rejection is overcome for at least the reasons that, as explained in the above discussion of claim 1, (i) there is no motivation for the combination of Egan and Ims, particularly in light of the fact that claim 38 is directed to a "vortex flowmeter" and recites "vortex shedding," and (ii) the combination does not disclose or suggest at least claim 38's multiple-PLL recitation of "phase-locked loops (PLLs) having different characteristics from each other and operable to receive the flow sensor signal and lock onto the flow sensor signal."

Ito describes a vortex flow meter with a low pass filter, and neither Thompson, Vignos, or Ito, alone or in combination, cures the deficiencies of Egan and Ims.

Accordingly, for at least these reasons Applicant submits that a prima facie case of obviousness has not been established with respect to claim 38 and claims that depend therefrom and, in the alternative, that such claims are patentable over the applied references.

Claims 29 and 36, each of which depends ultimately from either claim 1 or claim 21, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Egan, Ims, and Thompson and further in view of Lew (5,493,915). Applicant respectfully disagrees for at least the reasons discussed above with respect to claims 1 and 21. Lew describes a fluid dynamic torsional vortex sensor and neither Thompson nor Lew, alone or in combination, cures the deficiencies of Egan and Ims.

Claims 6 and 7, each of which depends from claim 1, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Egan, Ims, and Thompson and further in view of Bouillet (6,298,100). Applicant respectfully disagrees for at least the reasons discussed above with respect to claim 1. Bouillet describes phase error estimation and neither Thompson nor Bouillet, alone or in combination, cures the deficiencies of Egan and Ims.

Claims 10-12, each of which depends from claim 1, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Egan, Ims, and Thompson and further in view of Henry (5,570,300). Applicant respectfully disagrees for at least the reasons discussed above with respect to claim 1. Henry describes self-validating sensors and neither Thompson nor Henry, alone or in combination, cures the deficiencies of Egan and Ims.

Claim 23 (which depends from claim 1) and claim 28 (which depends from claim 21) both stand rejected as being unpatentable over Egan, Ims, and Thompson and further in view of Yatsuzuka (5,128,625). Applicant respectfully disagrees for at least the reasons discussed above with respect to claims 1 and 21. Yatsuzuka describes an adaptive phase lock loop system and neither Thompson nor Yatsuzuka, alone or in combination, cures the deficiencies of Egan and Ims.

Further, Yatsuzuka does not disclose or suggest at least "providing the output signal of the first PLL to the second PLL as a center frequency of the second PLL to assist lock-in by the second PLL" (claim 23) and "wherein the second phase-locked loop includes a center frequency input, and the center frequency input is coupled to the first output signal to assist lock-in by the second phase-locked loop" (claim 28). The Office Action points to disclosure in Yatsuzuka at column 14, lines 14-20 in which a training mode is used to determine a center frequency. However, Yatsuzuka clearly states that the purpose of the training mode is to provide an "optimum center frequency" (col. 14, line 24). In sharp contrast, the "the first PLL" of claim 23 and "the first phase-locked loop" of claim 28 (which provide the center frequency information in claims 23 and 28) are not recited as providing an optimum center frequency. Indeed, "the first PLL" of claim 23 has a "fast loop filter having a large natural frequency" (claim 21), and "the first phase-locked loop" of claim 28 has less accuracy and less immunity to noise than the second phase-locked loop (see claim 1). Accordingly, "the first PLL" of claim 23 and "the first phase-locked loop" of claim 28 are presumably non-optimum. In light of this distinction from Yatsuzuka, Yatsuzuka's disclosure does not render it obvious for "the first PLL" of claim 23 and "the first phase-locked loop" of claim 28 to provide center frequency information as recited. Again, as the examiner is no doubt aware, "'obvious to try' is not the standard under § 103." In Re O'Farrell, 853 F.2d 894, 903 (Fed. Cir. 1988).

The Office Action states that reference BG was not considered because no copy was provided. In response, Applicant has attached another copy of reference BG, along with a copy of the stamped postcard showing that the PTO received 25 references on February 24, 2004. As there were only 25 references on the Form PTO-1449, the PTO is presumed to have received a copy of each of the 25 references. Accordingly, the IDS filed on February 24, 2004, should be considered to have been complete and the provision of the additional copy herewith is not a

supplemental IDS. Applicant respectfully requests that the Examiner consider and initial reference BG, as well as reference AM which the examiner considered in the last Office Action.

Applicant does not agree with certain of the Office Action's characterizations of the cited references but, for clarity and brevity in argument, have generally not addressed such characterizations unless required by the line of reasoning in the above arguments. Accordingly, Applicant's silence should not be construed as acquiescing in any of the Office Action's characterizations of the cited references.

Enclosed is an $128 check for excess claim fees. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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Title of the Invention VORTEX FLOWMETER			
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Enclosures ·Information Disclosure Statement (1 page) ·Form PTO-1449 (2 pages) ·Documents listed on the Form PTO-1449 (25 documents) ·Check in the amount of $180.00